Progress and Challenges with Spatial Data Sharing for Arctic Research

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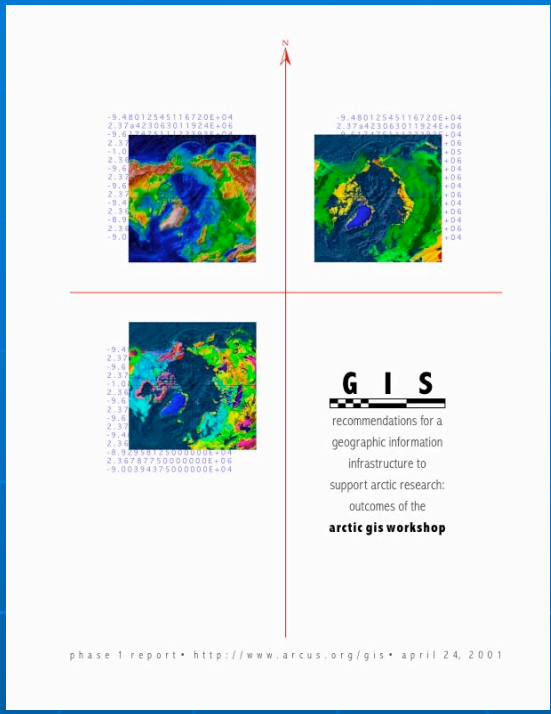
Caveats

- NSF-funded Arctic research community -- academia
- Geospatial
- Different “hats”

Bottom line …

2001 Arctic GIS Workshop

primary objective: develop ideas to promote the flow of georeferenced information within the arctic research community and to the broader public.

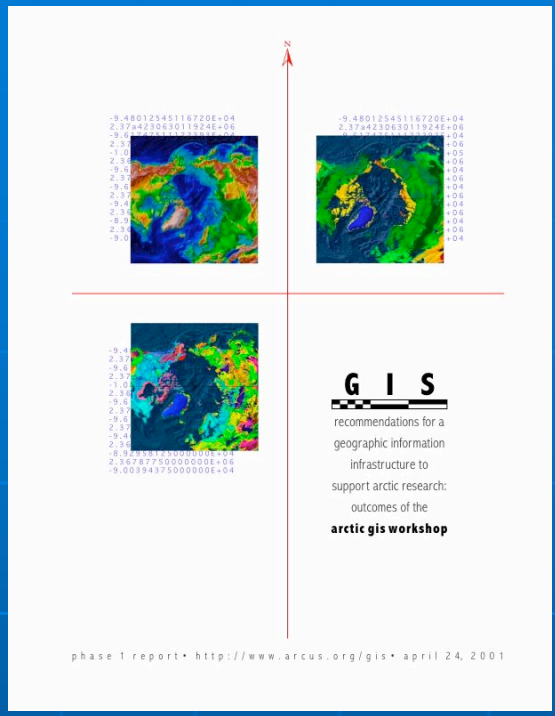


www.arcus.org/gis

2001 Arctic GIS Workshop

primary objective: develop ideas to promote the flow of georeferenced information within the arctic research community and to the broader public.

- minimize duplicated efforts
- reduce costs of data dissemination
- assist data-model comparisons
- facilitate inter- and multidisciplinary integration
- promote pan-arctic collaboration
- provide the tools to better communicate arctic science



www.arcus.org/gis

... develop an Arctic Spatial Data Infrastructure

Planning Efforts

2001 Arctic GIS Workshop and Report

2003 Arctic GIS Planning Meeting

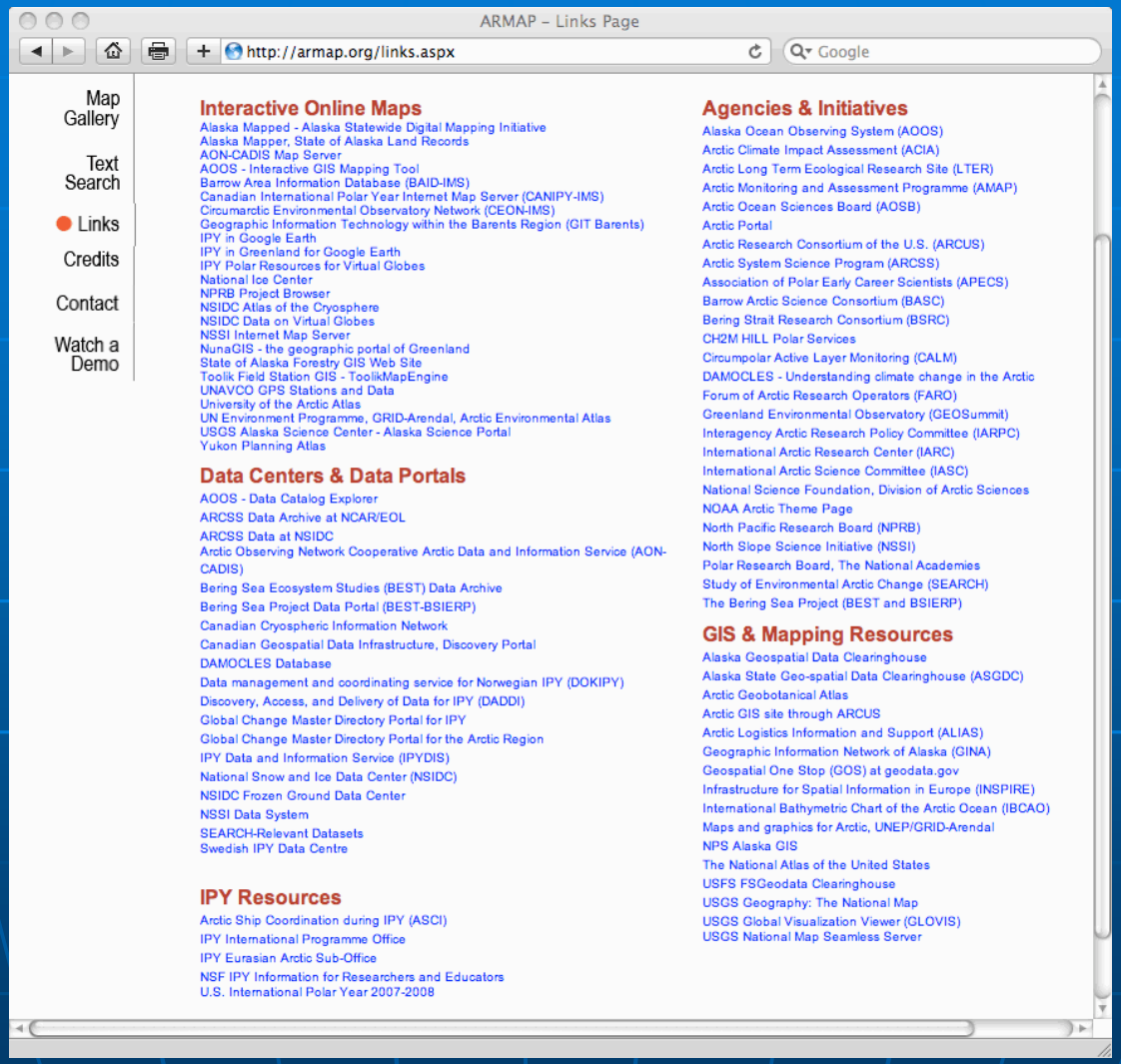
2003 North Slope GIS Meeting

2004 Arctic GIS White Paper

2004 Submission of ASDI proposals

... see www.arcus.org/gis

Progress



armap.org

The Problem

- Rapidly growing quantity of data
  (IPY, AON, etc.)
- Limited data sharing
- Fragmented efforts
- Duplicated cost
- Slow progress

Challenges

bottom-up vs. top-down

- *particular to the academic community*
- *academia way behind private sector*
- *way behind government (NPS, BLM, USGS, state agencies, etc)*
- *hinders coordination*

awards vs. contracts or cooperative agreements

- *award process can be slow*
- *post-award progress is less coordinated among distributed entities*

different schools of thought: “GIS” data vs. “normal data”

turf battles within the broad “data community”

user information overload

Lessons learned ...

from the Conservation GeoPortal

- decommissioned July 1, 2009
- ESRI, National Geographic Society, The Nature Conservancy, UNEP, ...

1. Outreach and promotion through various means is essential
2. Data/metadata publishing should be required and supported by managers and funders
3. In-kind support is great, but funds for maintenance, upgrades, curation, and marketing are essential
4. Centralized metadata creation is effective and efficient if funds are available
5. Portals should allow filtering by organizations, including branded sub-portals
6. Portals should support organizations' internal and external publishing needs
7. Without dedicated stewards, browse "channels" should be populated automatically, not manually
8. Usability and simplicity in finding and posting content is essential
9. Map viewers should be simple and usable for non-technical staff
10. The ***concept*** of sharing data is much more advanced than the ***practice***

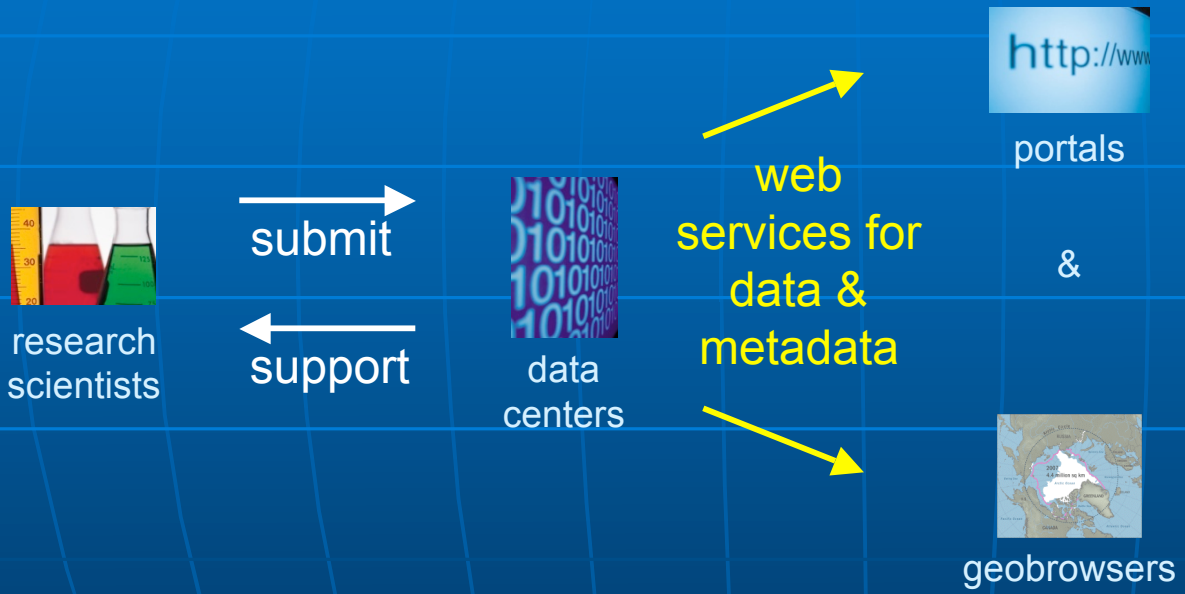
-- email to SCGIS

Goals

- ✓ avoid duplicated effort
- ✓ meet common objectives
- ✓ data sharing for analysis, integration, and synthesis

Interoperability …

… through established standards, “best practices”, and distributed services



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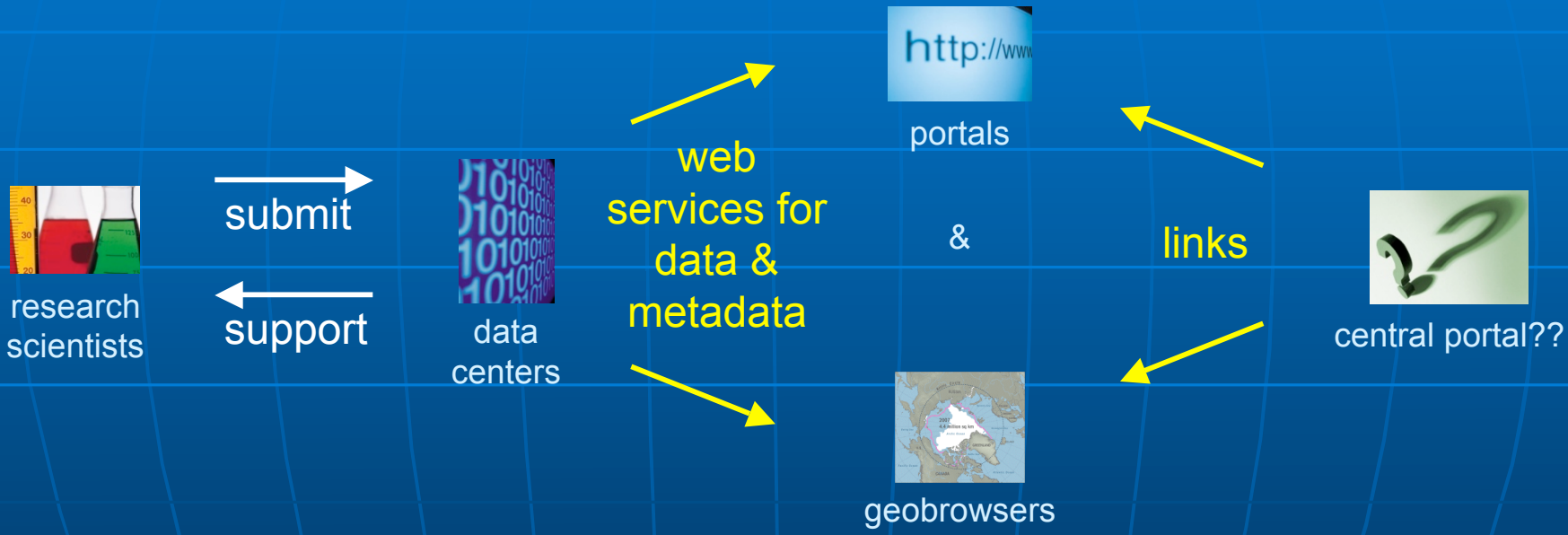

Three Tiers for Implementation

- **project databases**

  portals and geobrowsers for "high-level" information about specific research projects

- scientific datasets as represented by **metadata**

  one record per dataset, with standardized attributes (PI, Title, Abstract, etc.) and points or polygons for location

- the **scientific data** itself

  for visualization, analysis, integration, and synthesis

Technical Solutions

- adopt community standards for metadata
  DIF, FGDC, ISO, etc.

- adopt best practices in web services for interoperability with both metadata and data
  XML, WAF, GML, etc.
  WMS, WFS, WCS, KML, SOAP, REST, etc.

Cultural Solutions

- increase incentives for PI's to submit data
- help with data submission and creation of metadata
- collaboration among information providers
- establish web services for interoperability

Why share data and metadata through web services?

- idealism and altruism?

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- improved chances for further funding
- avoid duplicated effort as it impacts our own tasks and budgets

Design Considerations

- define the scope of each portal:
  - geographic extent
  - thematic content
  - functionality
- consider target audience
  - needs
  - technical ability
  - workflow
- design for the user experience
  - speed
  - stability
  - intuitiveness

Cultural Solutions, cont'd

- document need and use of shared data (stats)
- communicate to decision makers
- increase the generally recognized value of data

We can't just "preach to the choir".

New Opportunity through NSF

Organization of Projects on Environmental Research in the Arctic (OPERA)

- Deadline: December 11, 2009
- Funds: 1-4 awards, $10M - $15M over 3 years

... for activities to foster and sustain collaboration among projects funded by NSF that contribute to the US arctic environmental change research effort. ... IPY ... SEARCH ... AON ... provide resources to the scientific leadership that are needed to implement SEARCH's broad science agenda. ... One key additional effort, which has gained prominence during the IPY, is needed to tie all these together: **a robust and modern approach to managing and enabling discovery of Arctic scientific data.**

We're not limited by technology.
We're limited by our scientific culture.